

GP-303377

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DEC 13 2006****IN THE CLAIMS**

1. (Currently Amended) An inlet device for a reactor comprising:

a housing defining a frustoconical interior region having an inlet opening and an outlet opening for the passage of at least one fluid into and out of the frustoconical interior region and subsequently to the reactor;

a first and a second retention member, said first retention member in fluid communication with said inlet opening and said second retention member in fluid communication with said outlet opening, said first and second retention members are porous to permit fluid transfer into and out of the inlet device; and

a plurality of chemically inert particles contained within said frustoconical interior region between said first retention member and said second retention member; and

an insulator disposed proximate to the outlet opening, wherein the insulator is heat resistant to 1100°C.

2. (Original) The inlet device of claim 1, wherein said inlet opening comprises a diameter less than a diameter of said outlet opening.

3. (Original) The inlet device of claim 1, wherein said frustoconical interior region comprises a cone angle of about 20 to about 80 degrees.

4. (Original) The inlet device of claim 1, wherein said frustoconical interior region comprises a cone angle of about 30 to about 40 degrees.

5. (Original) The inlet device of claim 1, wherein said particles are spherical in shape.

6. (Original) The inlet device of claim 1, wherein said particles are comprised of zirconium oxide.

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7. (Original) The inlet device of claim 1, further comprising a tube mixer in fluid communication with said inlet opening.

8. (Original) The inlet of claim 7, wherein said tube mixer comprises a cylindrically shaped tube and a helical shaped divider longitudinally disposed within an interior region of said cylindrically shaped tube.

9. (Canceled)

10. (Currently Amended) A fuel reforming system comprising:

an inlet device for a reactor comprising a housing defining a frustoconical interior region having an inlet opening and an outlet opening for the passage of at least one fluid into and out of the frustoconical interior region and subsequently to the reactor, a first and a second retention member, said first retention member in fluid communication with said inlet opening and said second retention member in fluid communication with said outlet opening, said first and second retention members are porous to permit fluid transfer into and out of the inlet device, a plurality of chemically inert particles contained within said frustoconical interior region between said first retention member and said second retention member;

an insulator disposed proximate to the outlet opening, wherein the insulator is heat resistant to 1100°C; and

a reaction surface comprising a catalyst material, said reaction surface being subsequent to the inlet device downstream from the insulator and in fluid communication with said outlet opening.

11. (Original) The reforming system of claim 10, further comprising a tube mixer in fluid communication with said inlet device.

12. (Original) The reforming system of claim 11, wherein the tube mixer comprises a cylindrically shaped tube and a helical shaped divider longitudinally disposed within an interior region of said cylindrically shaped tube.

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13. (Canceled)

14. (Canceled)

15. (Currently Amended) The fuel reforming system of claim 10, further comprising at least one vaporizer upstream from the inlet device.

16. (Withdrawn) A method of mixing fluid in fuel reforming comprising:

flowing a fluid material into an inlet device comprised of a housing defining a frustoconical interior region having an inlet opening and an outlet opening, a first and a second retention member, said first retention member in fluid communication with said inlet opening and said second retention member in fluid communication with said outlet opening, and a plurality of particles contained within said frustoconical interior region between said first retention member and said second retention member;

mixing said fluid material to form a reactant mixture; and

reacting the reactant mixture with a reaction surface to form a reformat.

17. (Withdrawn) The method of claim 16, further comprising vaporizing said fluid prior to flowing the fluid material into the inlet device.

18. (Withdrawn) The method of claim 16, wherein forming the reformat comprises a partial oxidation fuel reforming process.

19. (Withdrawn) The method of claim 16, wherein forming the reformat comprises a steam reforming process.

20. (Withdrawn) The method of claim 16, wherein forming the reformat comprises an autothermal reforming process.